



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,155	11/04/2005	Yasuhiro Chouno	033082M237	9205
441 7590 01/30/2008 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036			EXAMINER CHANDRA, SATISH	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 01/30/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/522,155

Applicant(s)

CHOUNO ET AL.

Examiner

Satish Chandra

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8,9 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8,9 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 1/05, 7/05 and 8/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/11/2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farrens et al (US 6,780,759) in view of Parkhe et al (US 6,743,473), Yonenaga et al (US 5,972,114) and Rockerath et al (US 4,877,655).**

**Farrens et al disclose:**

**Regarding claim 8,** a substrate processing vessel 100 (Fig 1) for processing therein a substrate 2 (shown in phantom lines) with a processing fluid, comprising: a vessel body; a cover adapted to be separatably and hermetically joined to the vessel body to define a processing space 172 together with the vessel body; a plurality of

substrate support rods 154 incorporated into the vessel body; and a driving device 152 (actuator, Column 6, lines 19 – 24) adapted to vertically move the substrate support rods between a first vertical position and a second vertical position; wherein: each of the substrate support rods has a head adapted to support a substrate from below the same, and a shank extending downward from the head, the vessel body is provided with a plurality of vertical bores each having an open upper end opening into the processing space, and the shanks of the substrate support rods are vertically movably inserted in the bores, respectively, the said substrate processing vessel has a sealing part 164, 165, 161 and 162 for preventing leakage of the processing fluid from the processing space,

**Farrens et al do not teach:**

**Regarding claim 8,** support rods' (pins) heads unable to pass through the bore of the vessel body wherein the heads are configured to close the open upper ends of the bores at the first vertical position.

**Parkhe et al disclose:**

**Regarding claim 8,** lift pins 438 (Fig 5, Column 16, lines 9 – 20) having a conical head that fits in the recess to seal the gap.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide conical heads on the pins in the apparatus of Farrens et al as taught by Parkhe et al. It would have obvious to a skilled artisan to combine the prior art elements to yield predictable results such as providing lift pins having conical heads in the apparatus of Farrens et al.

The motivation for providing pins heads is to not only to seal the bores of Farrens et al but also prevent the pins from falling through the substrate holder in the apparatus of Farrens et al.

**Farrens et al and Parkhe et al do not disclose:** a driving device comprising arms respectively connected to the shanks of the plurality of substrate support rods projecting downward from lower ends of the bores of the vessel body, the arms being arranged under a bottom surface of the vessel body.

**Yonenaga et al disclose:**

**Regarding claim 8,** a plurality of lift pins protruding upward from a support member 20 wherein as the support member 20 is moved up and down by means of a push-up rod 22 (Fig 1) which penetrates the base of the process chamber 2. A coil spring 33 is fitted on that portion of each support rod 32 which is situated between the retaining member 16 and the support member 20. The push rod 22 is moved up and down by an actuator 28.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to a driving device comprising arms respectively connected to the shanks of the plurality of substrate support rods projecting downward from lower ends of the bores of the vessel body in the apparatus of Farrens et al and Parkhe et al as disclosed by Yonenaga et al. It would have obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a driving device comprising arms respectively connected to the shanks of the plurality of

substrate support rods projecting downward from lower ends of the bores of the vessel body.

The motivation for providing a driving device comprising arms respectively connected to the shanks of the plurality of substrate support rods projecting downward from lower ends of the bores of the vessel body is to vertically move the support rod up and down in the apparatus of Farrens et al and Parkhe et al.

**Farrens et al, Parkhe et al and Yonenaga et al do not disclose:** an arm locking mechanism having a stopper and an actuator for moving the stopper to separately engage with one of the arms to lock the said arm so as to prevent upward movement of the substrate support rods and resultant damage of the substrate when air to be supplied to the first air cylinder actuator is reduced.

**Rockerath et al disclose:** a ball holding and cementing apparatus and method (FIG. 1, Column 5, lines 60 – 67 and Column 6, lines 1 – 2), wherein a platform 36 is in the first position at the start of the use of the apparatus positioning ball holding device 10 directly over ball holder 16. When platform 36 is moved by cable cylinder 60 to the intermediate position positioning ball holding device 10 directly over coating tank 62, guide member 64 will be positioned directly in front of locking pin 66 driven by air cylinder 68 into a hole in the back of guide member 64 corresponding in size to closely interfit with locking pin 66 thus locking platform 36 in position during the spinning cycle.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a locking mechanism for locking the arm in the apparatus of Farrens et al, Parkhe et al and Yonenaga et al as taught by Rockerath et

al. It would have obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a locking mechanism for locking an arm in the apparatus of Farrens et al, Parkhe et al and Yonenaga et.

The motivation for providing a locking mechanism to engage with the arm to lock the arm is to adjust and lock the position of the arm in the apparatus of Farrens et al, Parkhe et al, Yonenaga et al and Rockerath et al.

**Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farrens et al (US 6,780,759) in view of Parkhe et al (US 6,743,473), Yonenaga et al (US 5,972,114) and Rockerath et al (US 4,877,655) as discussed in claim 8 above and further in view of Akaike et al (US 6,262,570).**

**Farrens et al, Parkhe et al, Yonenaga et al and Rockerath et al do not disclose:** an a second air cylinder actuator adapted to move the cover vertically between a raised position and a lowered position of the cover; and a cover locking mechanism having a stopper adapted to separatably engage with the cover or a member fixed to the cover to lock the cover so as to prevent downward movement of the cover and resultant collision of the cover with the substrate support rods when air to be supplied to the second air cylinder actuator is down.

**Akaike et al discloses:** an air cylinder 141 of the locking mechanism 32 (Fig 9) when actuated locks the head 24 thereby keeping it in vertical state (Column 11 lines 53 – 67 and Column 12 lines 1 – 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an air cylinder for a locking mechanism and to

move the cover up and down in the apparatus of Farrens et al, Parkhe et al, Yonenaga et al and Rokerath et al as taught by Akaike et al. It would have been obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a second air cylinder actuator adapted to move the cover vertically between a raised position and a lowered position of the cover in the apparatus of Farrens et al, Parkhe et al, Yonenaga et al and Rokerath et al.

The motivation for providing an air cylinder for a locking mechanism and to move the cover up and down is for the ease of maintenance and for making the space leak tight in the apparatus of Farrens et al, Parkhe et al, Yonenaga et al and Rokerath et al.

**Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farrens et al (US 6,780,759) in view of Parkhe et al (US 6,743,473), Toshima et al (US 2002/0045008), Ferreira et al (US 5,804,042) and Yonenaga et al (US 5,972,114).**

**Farrens et al discloses:**

**Regarding claim 15,** a substrate processing vessel 100 (Fig 1) for processing therein a substrate 2 (shown in phantom lines) with a processing fluid, comprising: a vessel body; a cover adapted to be separatably and hermetically joined to the vessel body to define a processing space 172 together with the vessel body; a plurality of substrate support rods 154 incorporated into the vessel body; and a driving device 152 (actuator, Column 6, lines 19 – 24) adapted to vertically move the substrate support rods between a first vertical position and a second vertical position; wherein: each of the substrate support rods has a head adapted to support a substrate from below the same, and a shank extending downward from the head, the vessel body is



provided with a plurality of vertical bores each having an open upper end opening into the processing space, and the shanks of the substrate support rods are vertically movably inserted in the bores, respectively, said substrate processing vessel has a sealing part 164, 165, 161 and 162 for preventing leakage of the processing fluid from the processing space.

**Farrens et al do not teach:**

**Regarding claim 15,** support rods' (pins) heads unable to pass through the bore of the vessel body wherein the heads are configured to close the open upper ends of the bores at the first vertical position.

**Parkhe et al discloses:**

**Regarding claim 15,** lift pins 438 (Fig 5, Column 16, lines 9 – 20) having a conical head that fits in the recess to seal the gap.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide conical heads on the pins in the apparatus of Farrens et al as taught by Parkhe et al. It would have obvious to a skilled artisan to combine the prior art elements to yield predictable results such as providing lift pins having conical heads in the apparatus of Farrens et al.

The motivation for providing pins heads is not only to seal the bores of Farrens et al but also to prevent the lift pins from falling down.

**Farrens et al and Parkhe et al do not teach:** an actuator adapted to move the cover vertically,

**Toshima et al discloses:**

A lifting mechanism 15 for moving the vessel cover 12 up and down (Fig 3, Para 0041).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a lifting mechanism in the apparatus of Farrens et al and Parkhe et al to move the vessel cover up and down as taught by Toshima et al. It would have obvious to a skilled artisan to combine the prior art elements to yield predictable results such as providing a lifting mechanism to move the vessel cover up and down in the apparatus of Farrens et al and Parkhe et al.

The motivation for providing a lifting mechanism in the apparatus of Farrens et al and Parkhe et al to move the vessel cover up and down as taught by Toshima et al is to optimize the processing apparatus of Farrens et al and Parkhe et al either for maintenance work or for moving the substrate in or out of the chamber.

**Farrens et al, Parkhe et al and Toshima et al do not teach:**

an actuator that includes springs pushing the substrate support rods (pins) upward, a pressing member attached to the cover and adapted to depress the substrate support rods (lift pins) against the resilience of the springs when the cover is lowered.

**Ferreira et al teaches** an actuator that includes springs 78 pushing the substrate support rods (pins) 74 upward, a pressing member 46 attached to the cover 47 and adapted to depress the substrate support rods (lift pins) against the resilience of the springs when the cover is lowered.

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to provide an actuator in the apparatus of Farrens et al, Parkhe et al and Toshima et al as taught by Ferreira et al.

The motivation for providing an actuator in the apparatus of Farrens et al, Parkhe et al and Toshima et al is to provide an alternate and equivalent actuator. Further, it has been held, Substitution of equivalents requires no express motivation. *In re Fount*, 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152, USPQ (CCPA 1967).

**Farrens et al, Parkhe et al, Toshima et al and Ferreira et al do not disclose:** each spring being concentric around the axial axis through each of the substrate support rods for pushing the substrate support rods upward.

**Yonenaga et al disclose:** a coil spring 33 is fitted on that portion of each support rod 32 which is situated between the retaining member 16 and the support member 20 (Fig 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a coil spring concentric around the axial axis through each of the substrate push rod in the apparatus of Farrens et al, Parkhe et al, Toshima et al and Ferreira et al as disclosed by Yonenaga et al. It would have obvious to a skilled artisan to combine prior art elements to yield predictable results such as providing a coil spring concentric around the axial axis through each of the substrate push rod in the apparatus of Farrens et al, Parkhe et al, Toshima et al and Ferreira et al

The motivation for providing a spring being concentric around the axial axis through each of the substrate support rods in the apparatus of Farrens et al, Parkhe et

al, Toshima et al and Ferreira et al is to optimize the substrate push rods of the apparatus of Farrens et al, Parkhe et al, Toshima et al and Ferreira et al.

### ***Response to Arguments***

Applicant's arguments with respect to claims 8, 9 and 15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund can be reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

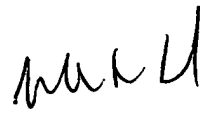
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number:  
10/522,155  
Art Unit: 1792

Page 12



Satish Chandra



Jeffrie R. Lund  
Primary Examiner

SC  
12/18/2007